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C. W. Ackerson

F. E. Mussehl

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Summary

1. Day-old poults were found to contain an average of 1.28 g. nitrogen, 0.18 g. calcium and 0.15 g. phosphorus.
2. Day-old poults were fed equal amounts of a good growing ration for 52 days. Analysis of these poults showed retention of 42.6 per cent of the nitrogen, 23.4 per cent of the calcium and 31.3 per cent of the phosphorus contained in the ration.
3. Retentions of nitrogen, calcium and phosphorus were on the same order as those obtained in like feeding trials with chicks.

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A SERIES of investigations on the utilization of nitrogen, calcium and phosphorus by growing chicks has been in progress at this Station for some years. Arguments in favor of a comparative slaughter test for evaluating various feeds for chicks were advanced, and data on the composition of newly hatched chicks were given in the initial report (1). Modifications of the feeding methods were made later (2). While numerous trials with chicks have been made, no similar work has been reported for turkeys. This paper will give data secured in 1936 on poults.

In order to provide a basis for a comparative slaughter test, 59 newly hatched poults were sacrificed and analyzed for nitrogen, calcium and phosphorus by the methods described in detail for chicks (1). The poults were not sexed. Analyses were made on composite samples of groups of five or six which had been digested with concentrated hydrochloric acid. Variations among the pooled samples were small. Table 1 shows that a newly hatched poult contains an average of 1.28 g. of nitrogen, 0.18 g. of calcium and 0.15 g. of phosphorus. As variation among samples was small, these values may then be used to represent the initial content of these elements in poults used in comparative slaughter tests.

TABLE 1. SUMMARY OF ANALYSIS OF 59 NEWLY HATCHED POULTS.

No. of poults in sample	Average wt. g.	Nitrogen g.	Nitrogen p.ct.	Calcium g.	Calcium p.ct.	Phosphorus g.	Phosphorus p.ct.
7	58	1.44	2.50	0.23	0.39	0.18	0.32
3	50	1.23	2.45	0.18	0.35	0.15	0.29
7	55	1.28	2.33	0.19	0.35	0.15	0.28
6	48	1.14	2.36	0.18	0.38	0.14	0.28
5	57	1.41	2.46	0.19	0.33	0.16	0.28
6	48	1.20	2.50	0.16	0.32	0.14	0.29
5	50	1.27	2.55	0.18	0.36	0.14	0.29
5	59	1.46	2.47	0.20	0.33	0.15	0.28
8	43	1.14	2.66	0.16	0.36	0.14	0.33
7	51	1.29	2.55	0.18	0.35	0.15	0.29
Average	52	1.28	2.48	0.18	0.35	0.15	0.29

Using day-old chicks a comparison was made of rations containing calcium carbonate and calcium sulfate as sources of calcium (3). It was decided to feed this calcium sulfate ration to day-old poults in order to study their utilization of nitrogen, calcium and phosphorus.

This ration was mixed as shown in Table 2, and machine pelleted by means of a 5/32-inch die, so that it could be fed to the poults without loss. Its composition is given in Table 3.

TABLE 2. INGREDIENTS OF THE RATION.

Ingredients	lbs.
Yellow corn meal	32.81
Shorts	19.30
Bran	9.65
Pulverized oats	9.65
Alfalfa meal	9.65
Meat scraps	4.82
Fish meal	4.82
Dried buttermilk	4.82
Sodium chloride	0.97
Calcium Sulfate	3.50

TABLE 3. ANALYSIS OF THE RATION.

	p.ct.
Water	11.0
Ash	8.5
Crude protein	18.6
Calcium	1.56
Phosphorus	0.77
Crude fat	4.3
Crude fiber	7.2
N-free extract	50.3
Ratio Ca:P	2.02

It was planned to obtain data on poults in the same manner as for chicks. No attempt was made to compare different rations. Ten-day-old poults were fed the ration from April 7 to May 29, using the same controlled intake procedure used to insure equal consumption of pelleted feed by chicks. During this period each poult consumed 945 g. of dry matter which contained 31.27 g. of nitrogen, 16.39 g. of calcium and 8.10 g. of phosphorus. Cod liver oil was fed by pipet at a level of about one per cent of the ration.

At the end of the feeding trial the poults were sacrificed and each bird was digested with concentrated hydrochloric acid. Nitrogen, calcium and phosphorus were determined on suitable aliquots. These data, coupled with those of Table 1, permit the calculation of the retention of these elements. A summary of pertinent growth data and composition of the poults at slaughter is given for individual poults in Table 4 since few such analyses are found in the literature. In this table the net weight is the weight after removal of the contents of the intestinal tract. The gain divided by 945 g. of dry matter consumed gives the percentage gain. The nitrogen, calcium and phosphorus in the gain were derived by subtracting 1.28, 0.18 and 0.15 from the amounts found in the poults since these amounts were found in day-old poults. The percentage retentions of the three elements were calculated from the amount in the gain divided by the amount fed, namely 31.27 g. of nitrogen, 16.39 g. of calcium and 8.10 g. of phosphorus.

Discussion

The low variation in the net weights of the poults is worthy of comment since the range is only 14 g., or less than four per cent of the average weight. This indicates the close agreement which can be attained by means of the controlled feeding technique used in this work. Individual variations in the retention of nitrogen, calcium and phosphorus were also small. A comparison of the retentions of these elements by poults with those found for chicks fed in a similar manner at this Station shows them to be of the same order. Since a chick ration was fed in this instance the growth response of the poults was perhaps slower than if a ration containing more protein had been fed. When chicks were fed a ration containing 20 per cent protein about 40 per cent of the ingested nitrogen was retained. The average retention of nitrogen by poults was 42 per cent, which is about the value found for chicks. The values found for calcium and phosphorus for poults coincide with those for chicks.

It appears from this study that utilization studies on food elements can be made on poults without difficulty. As a matter of fact, it was noted that poults were more tractable subjects than White Leghorn chicks which tend to be excitable in the cages. It is contemplated that further studies will be made with turkeys.

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TABLE 4. GROWTH AND ANALYTICAL DATA.

Poult No.	Net Weight	Gain	Gain	Gain per g. Nitrogen fed	Nitrogen in poult	Calcium in poult	Phosphorus in poult	Ratio Ca:P	Crude fat	Nitrogen in gain	Nitrogen Retained	Calcium in gain	Calcium retained	Phosphorus in gain	Phosphorus retained
	g.	g.	p.ct.	g.	p.ct.	p.ct.	p.ct.		p.ct.	g.	p.ct.	g.	p.ct.	g.	p.ct.
30	463	401	42.4	12.8	3.16	0.92	0.62	1.48	4.4	13.04	41.7	4.05	24.7	2.67	32.9
31	471	405	42.9	13.0	3.24	0.90	0.60	1.50	3.6	13.65	43.6	4.01	24.4	2.63	32.5
88	461	395	41.8	12.6	3.23	0.83	0.57	1.46	4.8	13.26	42.4	3.62	22.1	2.42	29.9
92	477	409	43.3	13.1	3.21	0.89	0.60	1.48	4.9	13.69	43.8	4.04	24.6	2.67	32.9
93	464	401	42.4	12.8	3.24	0.81	0.57	1.42	5.1	13.23	42.3	3.50	21.6	2.40	29.7
94	464	399	42.2	12.8	3.23	0.86	0.58	1.48	2.2	13.31	42.6	3.77	23.0	2.49	30.7
95	460	397	42.0	12.7	3.18	0.89	0.59	1.51	2.0	13.04	41.7	3.85	23.5	2.52	31.1
96	465	400	42.2	12.8	3.20	0.93	0.61	1.52	4.5	13.27	42.4	4.11	25.1	2.67	32.9
97	474	409	43.3	13.1	3.14	0.77	0.54	1.43	3.0	13.25	42.4	3.44	21.0	2.37	29.2
98	463	401	42.4	12.8	3.33	0.91	0.59	1.54	4.6	13.65	43.6	3.98	24.3	2.56	31.6
Av.	466	402	42.5	12.8	3.21	0.87	0.59	1.48	3.9	13.34	42.6	3.84	23.4	2.54	31.3